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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,760

07/19/2004

Guether Hambitzer

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6449

7590

05/15/2009

ROTHWELL, FIGG, ERNST & MANBECK, P.C.

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SUITE 800

WASHINGTON, DC 20005

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

05/15/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary	Application No. 10/501,760	Applicant(s) HAMBITZER ET AL.	
	Examiner Jonathan Crepeau	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7 and 9-31 is/are pending in the application.
- 4a) Of the above claim(s) 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,9-13 and 15-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 2/27/09 and 4/13/09 have been entered.

This Office action addresses claims 1, 3-5, 7, and 9-31. Claim 14 remains withdrawn, and claims 1, 3-5, 7, 9-13, and 15-31 remain rejected under 35 USC 103 over WO 00/44061. Further, the double patenting rejection over U.S. Patent No. 6,709,789 is maintained. This action is non-final.

Claim Rejections - 35 USC § 103

2. Claims 1, 3-5, 7, 9, 10, 13, and 15-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/44061. Hambitzer et al (U.S. Patent 6,709,789) is taken as an English equivalent of WO '061 herein.

Hambitzer et al. '789 teach a nonaqueous electrochemical cell having a positive electrode (3), negative electrode (4), and a separator (5). As shown in Figure 2, the negative electrode comprises a substrate (shown at 4) and a plurality of salt particles (10) located between the separator and the substrate. The salt is preferably an alkali metal halide (see col. 3, line 7). The

cell further comprises an electrolyte comprising sulfur dioxide (see col. 6, line 5). A negative active mass, which may comprise Li (see col. 6, line 1 et seq.), is deposited on the substrate and grows into the pores of the salt particles upon charging (see col. 3, line 20). Regarding claims 22 and 23, the positive electrode contains lithium cobalt oxide (see col. 6, line 1). The reference further teaches that the salt particles may be provided on a porous carrier material (18) that is in the form of a "carrier body" or a felt, fleece or fabric (see col. 4, lines 38 and 51). The carrier body can be a "chemically inert, rigid material, e.g., glass or oxide ceramics." It is also disclosed that the porous structure may be formed of a "porous solid matter layer" (see col. 5, line 12). Regarding claim 5, the porous salt and the carrier material completely fill the space between the substrate and the separator.

The reference does not expressly teach that the ceramic of the porous carrier material is in the form of particles having a volume proportion of at least 40%, as recited in claim 1.

However, the artisan would have been motivated to use the ceramic of Hambitzer et al. in a particulate form as the carrier for the salt particles. First, it is noted that, in one embodiment, the carrier body of the reference is made up of a plurality of fibers, although it is not limited thereto. It would have been obvious to use spherical "particles," rather than fibers, as the carrier material, absent a new or unexpected result. In general, a change in shape of a prior art element is not considered to impart a patentable distinction (MPEP 2144.04). Accordingly, insofar as the "fibers" of the reference are not considered to be "particles," it would be obvious to use particles of the ceramic as the carrier material. Furthermore, the reference teaches at column 5, line 12 that a porous structure formed by means of a porous solid matter layer is more advantageous than that formed by a "loose filling." Accordingly, this would have provided motivation to use a

relatively dense carrier body, e.g., a compacted particulate filling having a solids volume proportion of at least 40% rather than a “loose” particulate filling. Regarding claim 1, the ceramic (e.g., silica or alumina) would be inert, i.e., not ionically dissociating, to the cell components. Regarding claims 9, 10, 26, and 27, the ceramic would also have a melting point of at least 400C and a thermal conductivity of at least 20 W/mK.

Regarding claims 24, and 25, which recite that the volume proportion of solid particles in the porous structure is at least 50% or at least 55%, respectively, these ranges would be obvious in light of the teachings of the reference noted above. Further, the artisan would be sufficiently skilled to balance the use of a “carrier body” with the need to provide large enough pore sizes for the active mass to penetrate (see col. 5, line 5). Based on the teachings of the reference as a whole, the claimed ranges of particle volume proportion are not considered to distinguish over the reference.

Regarding claim 4, which recites that the porous structure contains at least two fractions of particles having different average particle sizes, this subject matter would also be rendered obvious. The sizes of the particles can be manipulated to affect packing density, and thus porosity, of the carrier material. Accordingly, it would be obvious to use more than one particle size in the carrier particles.

Regarding claim 16, which recites that the size of the salt particles is much smaller than the solid particles, this subject matter would be rendered obvious based on the fact that the purpose of the solid carrier particles is to support the salt particles. Therefore, it would be obvious to use solid particles that are larger than the salt particles that are being supported. Claims 17, 28, and 29 recite a size ratio of less than 1:2, 1:4, and 1:8, respectively, and would

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also be rendered obvious. Claims 18, 30, and 31, which recites that the volume of the salt particles is no more than 20%, 10%, or 5%, respectively, of the total solid volume of the porous structure, would also be rendered obvious based on the rationale provided above regarding the porosity of the porous structure.

3. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '061 as applied to claims 1, 3-5, 7, 9, 10, 13, and 15-31 above, and further in view of Aihara et al (2002/0102456).

Hambitzer et al. '789 do not expressly teach that the particles comprise a carbide or nitride of silicon, as recited in claims 11 and 12.

Aihara et al. is directed to a nonaqueous battery. In [0072] and [0074], the reference teaches an electrode comprising silicon carbide and silicon nitride powders as a filler.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Accordingly, the use of silicon carbide or silicon nitride as the ceramic of Hambitzer et al. would have been obvious to the skilled artisan.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 3-5, 7, 9-13 and 15-31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,709,789.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the ‘789 patent claims render obvious the instant claims for the reasons stated above.

Response to Arguments/Declarations

6. Applicant’s arguments and declarations under 37 CFR 1.132 filed April 13, 2009 have been fully considered but they are not persuasive. Applicants state on page 8 of the remarks that the Examiner provides no explanation as to why one of skill in the art would be motivated to use

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spherical particles as the carrier material. In response, as noted in the rejection, the structure of the carrier material of the '789 does not appear to be limited, although the reference teaches that a "loose" filling is less advantageous than a porous solid matter layer (col. 5, line 12).

Therefore, it is contended that a "loose" powder is within the purview of the invention of the '789 patent, although it may be considered to be a nonpreferred embodiment. As stated in the rejection above, the skilled artisan would be motivated to compact, densify, or interconnect the powder so as to make it an integrated layer. Accordingly, it is submitted that a relatively dense layer solids percentage of at least 40 vol. % would have been within the skill of the art to ascertain from the disclosure of the '789 patent. Therefore, the claimed range of at least 40% is still not seen to patentably distinguish the present claims from the '789 patent. In addition, it has been held that "a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If the leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense," and also that choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success is generally within the skill of the art. *KSR v. Teleflex*, 82 USPQ2d 1385, 127 S. Ct. 1727 (2007). In this case, the selection of ceramic particles in a relatively dense porous layer, and having a solids percentage of 40 vol%, could have been envisioned by a person of ordinary skill in the art from the teachings of the '789 patent.

Turning to the declarations, the statements of Dr. Ripp regarding the examples shown in the '789 patent and the instant application are noted. However, it is noted that in the '789 patent, there does not appear to be any Example that uses the ceramic carrier material. Such an embodiment using a ceramic material is considered to be the closest prior art to the claimed

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invention. The '789 patent appears to disclose Examples containing a number of salts; however, a porous layer containing only the salts is not considered to be the closest prior art. Additionally, in the instant specification, there does not appear to be any comparison of the instant invention to a battery having a ceramic carrier layer as suggested by the '789 patent. It is submitted that to show an unexpected result of the present invention relative to the '789 patent, an embodiment of the '789 patent containing a ceramic carrier material must be shown and tested. In addition, it is noted that in the present specification, only an Example having a solids content of 60 vol. % is disclosed, which is not commensurate in scope with the range recited in claim 1. It is submitted that to show that the features upon which Applicant relies actually produce an unexpected result, further comparative evidence should be submitted, such as a battery according to the '789 patent which contains a ceramic carrier in some form and which has a solids percentage of less than 40%, and a battery according to the present invention which has a particulate ceramic layer having a solids percentage of 40%. It is believed that such evidence is necessary, given the position of the Office that the claimed invention is fairly suggested by the '789 patent and there is not yet evidence to indicate that the claimed invention produces an unexpected result relative to the '789 patent.

Furthermore, regarding the arguments that the '789 patent teaches away from aspects of the claimed invention, these arguments are not persuasive for reasons previously set forth on the record, i.e., that it would be well within the skill of the art to design a compressed particulate porous layer that has a solid volume percentage of at least 40%, while still allowing the pores to be large enough to contain salt and active material according to the principles of the '789 patent.

Additionally, the declaration of Joachim Heitbaum has been carefully considered, but the above arguments are also applicable to this declaration. In particular, in section 4 of the declaration, Dr. Heitbaum asserts that “the resulting increase in safety and the simultaneous failure to degrade the performance of an electrochemical cell were unexpected results.” However, as established above, there is insufficient evidence of such results on the current record.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795
May 13, 2009